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COLOR TYPES OF CORALLORRHIZA MACULATA RAF.

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In the 7th edition of Gray's Manual, Ames describes *Corallorrhiza maculata* Raf. as madder-purple or yellowish; the white lip spotted with magenta-crimson. He notes the rare occurrence of pale forms without spots on the lip, petals, or sepals. In Britton and Brown's Flora the scape is described as purplish, the flowers as brownish purple, and the lip as white, spotted and lined with purple. There is also this note: "A form with yellow scape and flowers occurs in Nebraska (according to Williams)." Williams recorded his observations in an article entitled "Notes on the Canyon Flora of Northwest Nebraska" (Amer. Nat. **24**: 779–780. 1890) as follows:

"Leaving Harrison, we pitched our tent in War Bonnet Canyon . . . In nearly all of the canyons, especially the damper, darker ones, *Corallorrhiza multiflora* Nutt. grew quite plentifully, while only the darkest canyons afforded the rare *C. innata* R. Br. In a small canyon at the head of Jim Creek was found a lavender-yellow variety of the former species." The term lavender-yellow would seem to apply to a form with both purple and yellow pigmentation, rather than to a pure yellow, and unless the literature contains other observations by Williams which have eluded the writer's search, the occurrence of a pure yellow form in Nebraska is not clearly attested.

The pure yellow form of the East has been named *Corallorrhiza multiflora* var. *flavida* Peck. Originally described from New York, it has been reported by Alexander (Report Mich. Acad. Sci. **12**: 97.

1910), from the vicinity of Birmingham, Michigan. As will appear from the following quotation from a letter from Mr. Frederick J. Hermann, this variety is so distinct as to be worthy of recognition in our floras. He writes: "I am sending you a box containing three specimens of coral-root, and I wish you would please identify two of these for me. The first is a yellow one which I can't find described in any book on orchids. I had never seen it before yesterday, when I found about ten plants near Delaware, Keweenaw County, Mich., about twelve miles from Copper Harbor. Later in the day I found about six more specimens at Copper Harbor, Keweenaw County. Both of these colonies were in rather dense spruce woods, and growing in company with Menzies' rattlesnake plantain. At Delaware a few plants of *Corallorrhiza multiflora* were also growing with them. The second specimen is another one that I wish you would identify for me. The third is the common large coral-root (*C. multiflora*) which I thought you might like to use for comparison with the second."

Mr. Hermann's three types are all color varieties of *Corallorrhiza maculata* Raf. (=C. *multiflora* Nutt.), forming a series with regard to pigmentation similar to that in many cultivated plants, in which some varieties have yellow pigmentation due to glucosides of the flavonol group, other varieties, red or purple, containing anthocyanins. The Corallorrhiza series is exceptional in one respect, namely, that there is a variety with predominently brown coloration. This brown variety has a parallel in the brown-husked variety of maize, the latter being one of a series of color types in which the genetical relations have been carefully worked out by Emerson.[1] The brown type in maize has been found to contain a yellow flavonol glucoside, and the brown coloration is probably due to some unknown reaction of the yellow pigment with other plant constituents. If the maize series contains a type with a bright yellow coloration of the husk, it is as yet unknown. The parallelism of the color types in Corallorrhiza with those of plants which have been investigated genetically is pointed out, because it gives the best reason to assert confidently that these types are genetical entities, and not mere variations due to environment.

[1] Emerson, R. A. The genetic relations of plant colors in maize. Cornell Univ. Agric. Exp. Sta. Mem. 39. pp. 156. 1921.

Advantage was taken of Mr. Hermann's fresh specimens to match their colors in Ridgway's "Color Standards and Color Nomenclature" (Washington, 1912). The first type, identified as var. *flavida*, has lemon-yellow flowers with an unspotted, white lip; scape and sheaths Martius-yellow. In the second type, which may be called var. *fusca*, the scape and developing fruits are light cinnamon-drab. (Perhaps this tint was what Williams called lavender-yellow, since it has both purple and yellow components.) The sheaths are Vandyke-brown, and give var. *fusca* its prevailing brown tone. In the third variety the scape and developing fruit are Perilla-purple. The sheaths are a much paler purple than the scape. In this type, which may be called var. *punicea*, there is no trace of brown whatever, in any part of the plant.

In species in which the genetical relations of yellow and purple types are known, the pure yellow has the most recessive factors and the deepest purple the most dominant factors. Geographic distribution indicates that the recessive types more often arise from the dominants than *vice versa*. Consequently the deeply purple-stemmed var. *punicea* might with some reason be viewed as the biological type of the species, and therefore chosen, in the absence of a type specimen, as the nomenclatorial type as well. In most species the var. *typica* is not formally named. These saprophytic orchids, however, undergo brown discoloration in drying, and are probably not varietally distinguishable from old herbarium material. Since practically all distribution records have been based upon dried material, there is a practical reason for wishing to continue to use the binomial for the species in the most comprehensive sense, without implying any particular variety. Consequently var. *punicea* is named as well as the other two. The species probably contains still other varieties.

By way of summary, the color types of *Corallorhiza maculata* may be characterized as follows:

Var. **flavida** (Peck) comb. nov. (*C. multiflora* [Nutt. var.] *flavida* Peck, N. Y. State Mus. Rep. **50**: 126. 1897.) scapis vaginisque et fructibus immaturis pallide flavis; floribus flavis; labello albo, immaculato.

Var. **fusca** var. nov. scapis et fructibus immaturis subfuscis, paulum rubrotinctis; vaginis atrofuscis; floribus ochraceis, purpureomaculatis; labello maculato.

Var. **punicea** var. nov. scapis et fructibus immaturis puniceis,

vaginis pallide purpureis; floribus ochraceis, purpureomaculatis; iabello maculato.

Specimens of all three forms, collected by Frederick J. Hermann in the vicinity of Cooper Harbor, Keweenaw County, Michigan, 20 June 1922, are preserved in the Herbarium of the University of Michigan.

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SOME INTERESTING PLANTS OF THE VIRGINIA COASTAL PLAIN.

E. J. GRIMES.[1]

(Plate 138.)

THE following plants have not hitherto been recognized as members of the coastal plain flora of Virginia, or are otherwise of interest. Practically all were collected on the peninsula between the York and James Rivers. Specimens of the species reported are deposited in the Grimes herbarium under the numbers given and there are duplicates in various other herbaria. Unless otherwise specified determinations were made by Mr. C. A. Weatherby at the Gray Herbarium. To all the botanists who have aided in this way, and to Mr. Edwin H. Lincoln for permission to use the copyrighted photograph reproduced herewith, grateful thanks are due.

Species new to Virginia are indicated by an asterisk; those new to the Gray's Manual range by two asterisks.

**UNIOLA LONGIFOLIA Scribn. Near Williamsburg, Sept. 18, 1920. No. 3038. Dry white oak slope. Infrequent: the only station observed. Not hitherto reported north of Georgia on the Atlantic slope, though occurring in eastern Tennessee. Determined by Mrs. Agnes Chase.

**PSILOCARYA CORYMBIFERA (C. Wright) Benth. Lake Drummond, near Portsmouth Ditch, Dismal Swamp, Oct. 2, 1921. No. 4534. Open swamp. A striking extension of range for this apparently rare and local species, not hitherto known north of Georgia.

[1] These notes, reporting a number of remarkable extensions of range, were in process of compilation by Professor Grimes at the time of his death in December, 1921: they have been prepared for publication by Mrs. Grimes.—Ed.